Menlo Park Notebook #3 [N-78-11-21]

This notebook covers the period November 1878-January 1880. It contains tests for non-radiating substances conducted by John K. Knight during November and December 1878 and results of Knight's research to find a chemical to extend the red spectrum. There are also entries by Edison, Charles Batchelor, Francis Upton, and John Kruesi. These include notes, drawings, and calculations about generators; drawings of lamp sockets; miscellaneous drawings, calculations, and experiments relating to electric lighting; notes by Edison on thermopiles; and notes by Batchelor on Edison's telephone. The book contains 282 numbered pages.

Blank pages not filmed: 24-25, 82-83, 116-117, 158-161, 194-199, 202-237, 242-249, 252-281.

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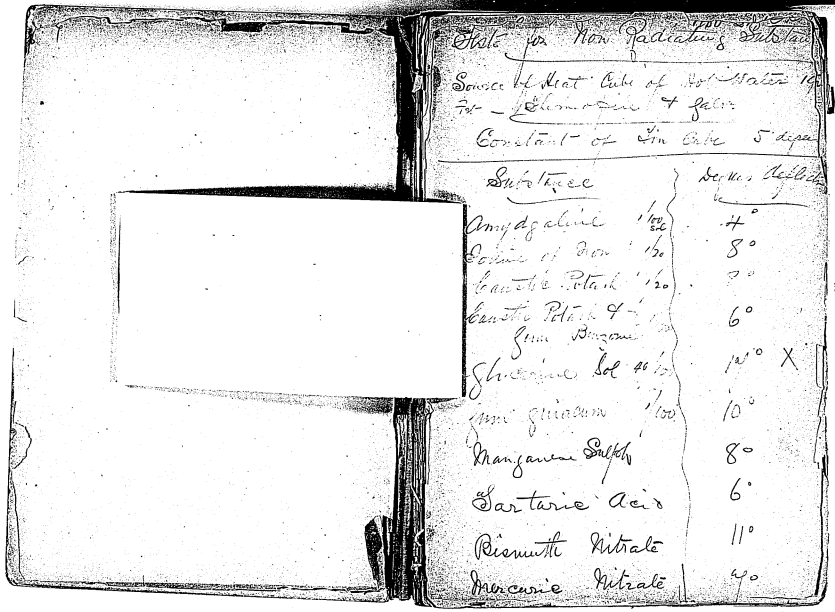


Scale for Non Radiation Substances

Source of Heat Cube of Hot Water 19
For — Thermopile & Galv
Constant of Tin Cube 5 degrees

Substance	Degrees Deflection
Amygdaline 1/100 Sol	4°
Solution of Iron 1/50	8°
Cane Sugar 1/20	9°
Cane Sugar & 1/20 Gum Benzoine	6°
Strychnine Sol 1/40	12° X
Iron Citrate 1/100	10°
Manganese Sulph	8°
Tartaric Acid	6°
Bismuth Nitrate	11°
Mercuric Nitrate	40

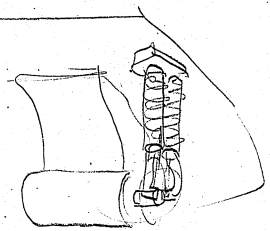
Continued Nov 21 '98 H.R.

22

Chemicals	Degrees deflected	
Chloride Lime	6°	
Ammonic Oxalate	10°	
Sulph Magnesia	6°	
Lamp Black	20°	X
Glycerine	21°	X
Lamp Blk & Glycerine	21°	
Caustic Potash Sol	10°	
Phosphate Lime & Glycerin	21°	
Pepsine Sol 1/20	11°	
Gum Shellac & Caustic Potash Sol 5/100	12°	
Valerianate of Zinc 1/100	8°	
Licorice Sol 20/100	18°	
Gum Arabic " 1/100	11°	

Continues Hor. 22-8
CKK 28/78

Chemicals	Deflection
Tannic Acid 1/20	14°
Sulph Copper 1/20	15°
Chrome Alum	16°
Paris green	19°
Sparmaceti	9°
Cocoa Butter	16°
Starch	7°
Starch Iodide	12°
Bromyl or Glycerine	10°
Sulph Cyanide	8°
Sulph Antimony	10°
Sulphur in Sperm Oil	9°
Sulphur in Bi Sulphcarbon	8°

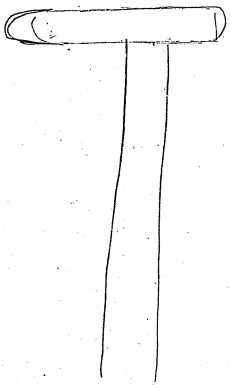


Continued Nov 23 1898 9

ORA

Chemicals	Deflection
Ammonia Water	4°
Sulph Potash - Sat.	8°
Sulph Antimony in Bi Sulphide Carbon	10°
Nitrate Strontia 40/100	9°
Aloin 1/100	12°
Paper White	8°
" Glycerine	20°
" Lampblack	18°
" Litmus Sol	10°

over



Continued Nov 25. 98

Chemicals		Reflection
Paper Camphoric Acid	1/100	13°
" Chloride Lithium	1/5	9°
" Hyposulphate Soda	1/5	11°
" Cyanide Mercury	1/100	12°
" Sulphate Quinine	1/100	10°
" Acetate Nickel	1/100	9°
" Dextrine Sol		10°
" Balsam Copabia		14°
" Balsam Peru		20°
" Venice Turpentine		15°
" Collodion (Thin)		5°
" " (Thick)		4°
" Albumin (dry)		8°

Continued. Nov 26. 98.

Chemicals	Deflection
Paper Oil Rosemary	9°
" Coach Body Varnish	10°
" Wearing Body Varnish	9°
" Oil Wintergreen	11°
" Oil Pennyroyal	13°
" Creosote	12°
" Cade Oil	18°
" Tannic acid	9°
" Oil Citronella	9°
" Oil Savory	10°
" Oil Spruce	12°
" Balsam Fir	14°

Continued Nov 27, 78

D. K. Knight

Chemicals	Deflection
Paper Oil Spearmint	9°
" " Bergamot	9°
" " Sassafras	12°
" Furniture Varnish	15°
" Oil Cubebs	14°
" Union Salad Oil	10°
" Bi Carb Soda	8°
" Bi Chrom Potash	11°
" Chloral hydrate	12°
" Dextrine & Acetic Acid	6° X
" Arsenonic Acid	4°

Continued. Nov 28. & 29 - 1878
J. H. Knight

Chemicals	Deflection
Paper Lead Acetate	12°
" Sulph Potash	10°
" Chloride Zinc	10°
" Chloride Ammonia	13°
" Nitric Nitro Prussiate	10°
" Permanganate Potash 5 grs	10°
" Tartaric Manganese 1 grs	12°
" Acetone & Flour Sulphur	5°
" Gamboge	8°
" Anthracate Potash	8°
" Caustic Potash 5 grs	
grs Sandarac 5 "	11°
100 H-O	

Continued Nov 29. 1898
J. E. D. A. Knight

℞ Chemicals	Deflection
Paper Chrome Alum	12°
" Prussiate Lime - Gm	10°
" Bi K. Ox Manganese "	6°
" Fluor Spar "	4½°
" Silicic Acid "	10°
" Caustic Baryta "	7°
" Gum Tragacanth "	13°
" Powdered Marble "	8°
" Burnt Umber "	10°
" Wellarium Ore "	12°
" Fire Clays "	11°

Continues Nov 30 & Dec 2 / 78

D.R.A. Bigelow

Chemicals	duplicates
Paper Tripoli - gum	8°
" Rotten Stone	10°
" Vellowsin (Thick)	10°
" Marble "	9°
" Rotten Stone "	9°
" gum Damar	12°
" " " Alco. gum	9°
" Mica (Thin)	10°
" Chalk	
" Alumina	12°
" Caustic Magnesia	11°

Continued Dec 2. 98

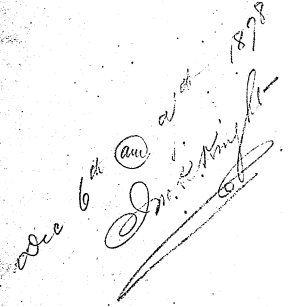
Chemicals	Deflection	
Paper Carb. Baryta	9°	Flat Plate
" Fine Clay & Collodion	4½°	
" Chalk & Collodion	4½°	
" Blk. Oxide Mang & do	5°	Bad Plate
" Chalk & Asbestos	8°	
" Chalk (Thin)	11°	
" Crocus Antimony Carb Paris	4½°	
" Blk Ox Manganese " "	8°	
" Plaster Paris	10°	
" Peroxide Lead " "	12°	
" Hypophosph Iron " "	4½°	

Spectrum Tests

To find a chemical that will Extend the Red Spectrum

Picalé Ammonia	1 gr. 100 Hs	Reduces
Chlor Barium	1 " 100 "	Reduces
Acetate Zinc	5 " 100 "	Reduces
Flavonol Sodium	.1 " 100 "	Reduces Slightly
Sulpho Carbolat Lime	1 " 100 "	Reduces "
Baptisin	1 " 100 "	Reduces "
Chloride Iron	1 " 100	Reduces
Acetate Uranium Potash	5 " 100 "	Reduces
Iodide Potassium	1 " 100 "	Reduces
Gum Senegal = Caustic Potash	5 " 1 " 100 "	Reduces
Citric Acid	20 " 100 "	Reduces
Iodide Zinc	5 " 100 "	Reduces
Arsenious Acid	5 " 100 "	Reduces

Dec. 6. 1898



Spectrum List- Continued 29

Carbozotate Ammonia	1/32	100 Ho	Reduces
Oxalate Ammonia	5 "	100 Ho	"
Salicine	5 "	100 Ho	"
Chloride Ammonium	1 "	100 Ho	" Slightly
Sulph Quinine	100 Ho	100 Ho	" "
Acetate Strontia	5 gr	100 Ho	Reduces
Caustic Baryta	5 "	100 Ho	" "
Chloride Strontia	50 "	100 Ho	" Slightly
Sulphate Lithia	1 "	100 Ho	Reduces
Sulphate Caffin	1 "	100 Ho	"
Proto chloride Iron	5 "	100 Ho	" Slightly
Picrotoxin	500 Mn	100 Ho	No Variation
Sulph Morphia	1 gr	100 Ho	Reduces
Boracic Acid	3 "	100 Ho	"

over

Dec 7th 1878

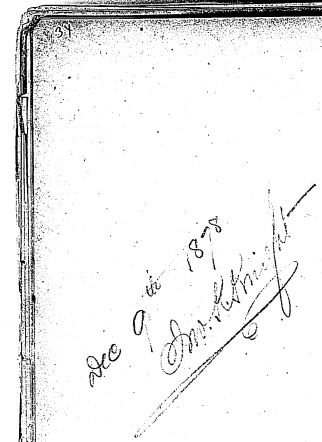
Spectrum Test — Continued

Sulphite Magnesia	1 gr	100 ℏ	Reduces Slightly
Amygdaline	1 "	100 "	No Appearance
Sulpho Vinate Soda	20 "	100 "	Reduces
Sulphate Alumina	5 "	100 "	Reduces
Iodide Calcium	5 "	100 "	Reduces Slightly
Lupulus	1 "	100 "	Reduces
Sulpho Carbite Soda	5 "	100	Reduces Slightly
Sulpho Cyanide Potassium	1 "	100 "	No Change
Sulphuret Calcium	1 "	100	Reduces
Valerinate Zinc	1 "	100 "	No Change
Acetate Nickel	6 "	100 "	Reduces
Proto Acetate Copper	1 "	100	Reduces

Over

Spectrum Reds. continued

Hydrosulphate Manganese	1 gr.	100 H2O	Reduces
Acetate Alumina	1 gr.	100 H2O	Reduces
Benzoic Acid	1 gr.	100 H2O	Reduces
Alum	1 gr.	100 H2O	Reduces
Valerianate Magnesia	1 gr.	100 H2O	Reduces
Manganate Soda	1 gr.	100 H2O	Reduces
Glaucate Soda	5 gr.	100 H2O	Reduces
Camphoric Acid	20 gr.	100	Reduces
Sulphate Soda	25 gr.	100	Reduces
Nitrate Strontia	1 gr.	100 H2O	No variation
Sulphate Cobalt	1 gr.	100 H2O	Reduces
Arseniate Soda	5 gr.	100 H2O	Reduces



Spectrum Ext. Continued

Borate Potash	1 gr 100 H2O	Reduces
Sulph Quinidine	200 Mil 100 H2O	No diff
Citrate Quinine	100 Mil 100 H2O	Reduces
Hypophosph Soda	1 gr 100 H2O	Reduces Lilac
Hippuric Acid	150 M 100 H2O	Reduces
Arsenate Quinine	1 gr 100 H2O	Reduces
Carbonate Soda	20 gr 100 H2O	Reduces
Hyposulph Soda	20 gr 100 H2O	Reduces Lilac
Citric Acid	40 gr 100 H2O	Reduces
Phosphate Lime	1 gr 100 H2O	Reduces

Dec 10 1878

Spectrum Tests Contin'd

Gum Arabic	20 gr	100 Ho	Reduces
Oxalate Soda	3 gr	100 Ho	Reduces
Arsenite Soda	5 gr	100 Ho	Reduces
Sulphate Zinc	5 u	100 Ho	Reduces little
Sulphuret Barium	1 .	100 Ho	Reduces
Tartrate Soda	20 .	100 Ho	Reduces
Bi Carb Soda	8 .	100 Ho	No perceptible
Tungstate Soda	20 .	100 Ho	Reduces
Borate Soda	8 .	100 Ho	Reduces
Bromide Potassium	20 .	100 Ho	Reduces slightly
Bromide Cadmium	5 u	100 Ho	No change
Chlorate Potassa	3 u	100 Ho	Reduces

Dec. 10th 1878

Spectrum. Tests Continued

Formiate of Copper	1gr 100 H0	Reduces
Sulphate Uranium	5 gr 100 H0	Reduces
Bichromate Potash	3 gr 100 H0	Reduces
Phosphate Ammonia	5 gr 100 H0	Reduces Slightly
Cochineal Sol	— —	Reduces
Phosphorus in Bi Sulphide	— —	Reduces Slightly
Bichromate Ammonia	5 gr 100 Aq	Reduces
Formiate Soda	5 gr. 100 H0	Reduces Slightly
Sulphate Magnesia	40 gr 100 H0	Reduces
Per Nitrate Iron	Pink Sol	Reduces
Acetate Baryta	5 gr. 100 H0	Reduces
Molybdaenic Acid	200 m 100 H0	Reduces Slightly
Uranic Nitrate	—	No Change

Spectrum Tests Continued
Dec 11. 78 D.H.H.

Lead Acetate	——	Reduces Little
Sulph Potassium	——	No apparent Change
Oxalate Soda	1 gr 100 H2O	Reduces
Pepsin	1 gr 100 H2O	Reduces Little
Nitrate Magnesia	1 gr 100 H2O	Reduces
Citrate Ammonia	1 gr 100 H2O	Reduces Little
Nitrate Uranium	1 gr 100 H2O	Reduces
Saponin	1 gr 100 H2O	Reduces
Chloride Mercury	1 gr 100 H2O	Reduces Little
Phosphate Manganese	1 gr 100 H2O	Reduces
Lactic Phosphate Peroxide Fe	1 gr 100 H2O	No Change
Phosphate Potash	1 gr 100 H2O	Reduces

(over)

Dec 11. 78
D.H.H.

Dec 11 th 1878
J. K. Knight

Spectrum Tests Dec 11 '78
J. K. Knight

Chloride Strontia	20 gr	100 Ho	Reduces
Phosphate Calcium	1 gr	100 Ho	Reduces Lit
Grape Sugar	20 gr	100 Ho	Reduces
Bi Carb Potash	5 gr	100 Ho	Reduces
Phosphate Ammo Soda	5 gr	100 Ho	Reduces
Monochloric acetic acid	5 gr	100 Ho	No change
Sulph Cinchonidin	1 gr	100 Ho	Reduces Lit
Sulphate Strontia	1 gr	100 Ho	Reduces
Sulphate Strychnine	1 gr	100 Ho	Reduces
Citrate Potash	5 gr	100 Ho	No change
Hypophosph. Baryum	5 gr	100 Ho	Reduces Lit

Spectrum test — Dec 12, 78

John K. Knight

Acetate Strychnine	1 gr 100 Ho	Reduces Litmus
Iodide Zinc	1 gr 100 Ho	Reduces
Acetate Baryum	1 gr 100 Ho	Reduces
Nitrate Silver	1 gr 100 Ho	Reduces
Flouride Sodium	5 gr 100 Ho	No change
Acetate Ammonia	1 gr 100 Ho	Reduces
Acetate Lead	5 gr 100 Ho	Reduces
Chloral Hydrate	1 gr 100 Ho	Reduces Litmus
Chlorine	—	Reduces
Magnesium Sulph & Am Ch	—	Reduces
Ammonia Chloride	—	Reduces
Sulphate Lime	1 gr 100 Ho	Reduces

OVER

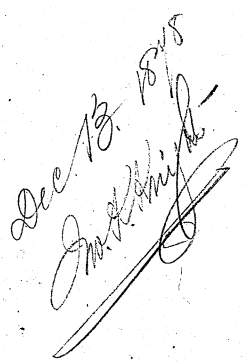
Dec 12 78
John K. Knight

Dec 12. 1875

Spectrum Test Continued
Dec 12-75 JKK

Asparagin	1gr	100 Ho	Reduces Ho
Propylamin Cl	1gr	100 Ho	Reduces
Iodide Ammn	1gr	100 Ho	Reduces
Glycerine	5gr	100 Ho	Reduces Ho
Venice Turpn	5gr	100 Ho	Reduces
Caustic Potash	1gr	100 Ho	
Camboge	2gr	100 Ho	Reduces
Cardegaine Poison	5gr	100 Ho	Reduces Ho
Sulphate Bebeirin	1gr	100 Ho	Reduces
Carbon Perm Caustic Potash	1gr 2a	100 Ho	Reduces
Tersqui Chlor Iron	5gr	100 Ho	Reduces Ho

Over



Spectrum Hist Continued
Dec 18, 78, EKR

Cambogia	5 gr	100 Hs	Reduces
Caustic Potash	1 gr		
Gum Benzoine	5 gr	100 Hs	Reduces
Caustic Potash	1 gr		
Balsam Tolu	5 gr	100 Hs	Reduces
Caustic Potash	5 gr		
Gum Guacum	5 gr	100 Hs	Reduces
Caustic Potash	1 gr		
Hydro Potassic Carbonate	—		Reduces
Potassic Hydrate	—		Reduces Lith
Potassic Carbonate	—		Reduces
Potassic Carbonate	—		No change
Potassic Nitrate	—		Reduces Lith

Spectrum Test — Columbia

Dec 13, 1878

Hydrosulphuric Acid	Reduces Hyp
Benzoic acid	No change
Chlorine Water	Reduces
Nitro Hydrochloric acid	Reduces Chl
Cupric Sulphate	Reduces
Cupric Nitrate	Reduces Chl
Chromic & Potassic Sulphate	Reduces Chl
Nickel Sulphate	Reduces
Anthracali Potassic Sp. Iodide	Reduces
Ferrous Chloride	Reduces Chl
Argentic Nitrate	Reduces
Ammonic Molybdate	Reduces Chl

Dec 13. 1878

Dec 13th 1878 Jno. A. Scott

Spectrum Tests Continued
Dec 13th 1878 JAS

Palladic Chloride	Reduces
Indigo Solution (weak)	Reduces
Ferric Chloride	Reduces to
Ammonia Water	No change
Solution Tersulphuret Arsenic in Ammonia	Reduces
Lithium Solution	Reduces
Sodic Nitro Prusside	Reduces
Tannic Acid	Reduces
Ammonia Sulph Hydrate	Reduces Strongly
Pyroxylic Spirit	Reduces slightly
Benzin	Reduces slightly

Dec 14th 1878

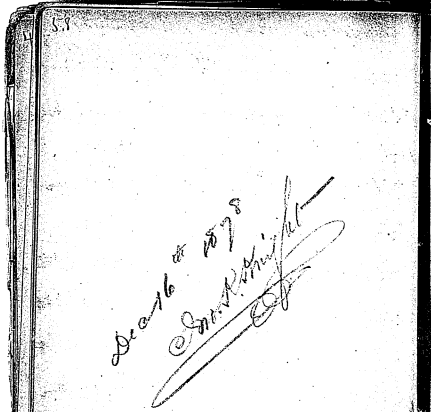
Spectrum Test Continued
Dec 14th 1878 DSK

Sesquichloride Iron Sol.	Reduces
Sulphurous acid	Reduces Slightly
Alcohol	Reduces Slightly
Alcohol & Cochineal	Reduces
Alcohol & Caustic Soda	Reduces Slightly
Alcohol & Cadmium Chloride	Reduces Slightly
Alcohol & Santonine	Reduces Slightly
Sol Nirvanine in H2O	Reduces
Sol Nirvanine in alcohol	Reduces
Alum water	Reduces Slightly
Glycerine, strong	Reduces Slightly
Glycerine & Chlor Iron	Reduces

Spectrum Test — Corbin's
Dec. 11-78 DKR

Balsam Caporiba & Mica	No Change
Alcohol & Salycylic Acid	Reduces Lines
Balsam Caporiba & Oil Lemon	Reduces Lines
Glacial Phosphoric Acid	Reduces
Crystal Ferro Cyanide Potassium (Yellow)	Reduces Lines
Alcohol & Gum Hemlock	Reduces
Paraffin on Glass Sandstone	No Change
" " " Shale	Reduces
Silicate of Soda	No Change
Oil Fennel	Reduces Slightly
Sand Oil	No Change
Oil Spearmint	Reduces

Dec 11th 1878
D. K. Rankin



Specimen Sets Continued 17

Dec 16th 1878 JAW

Alcohol & Amilin		Sulphate	Reduces Ltd
Oil	Cloves	on Mica	Reduces.
Oil	Juniper Berries	"	Reduces
Oil	Sandalwood	" "	Reduces
Oil	Bolon	" "	Reduces Ltd
Oil	Lemongrass	" "	Reduces Ltd
Oil	Peppermint	" "	Reduces Ltd
Oil	Bergamot	" "	Reduces
Oil	Pennyroyal	" "	Reduces
Oil	Anise	" "	Reduces Ltd
Oil	Otto Thyme	" "	Reduces Ltd
Oil	Juniper wood	" "	Reduces

60

Dec 16th 1878

61

Spectrum Sheet Continued
Dec 16th 1878.

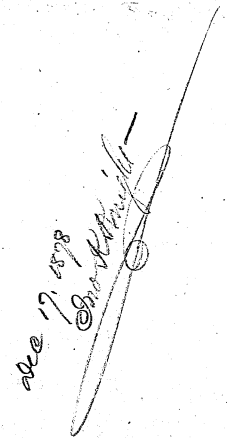
Oil Citronella or Juicca	Reduces Cost
" Orange " "	Reduces
" Lavender Flowers " "	Reduces
" Cassia " "	Reduces
" Cassia " "	Reduces
" oil Rosemary " "	Reduces
Hydrochloric Acid & Ammonia Fumes	Reduces
Crystal of Gum Damar	Reduces
" " Alcohol	Reduces
" " Camphor	Reduces
" " Saltpeter	Reduces
" " Gum Sandrac	Reduces

Dec 14 1875

Spectrum Scale continued

DEC 17 [illegible] SKK

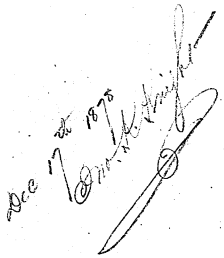
Hydrat of Ferrous Sulphate	Reduces
" " Sulph Copper	Reduces
" " Bi Chromate Potash	Reduces
Glycerine & Picrotoxin	Reduces
" " Amygdaline	No Change
" " Sulphate Quinidin	Reduces little
" " Valerianate Zinc	Reduces little
" " Nitrate Mercurious	Reduces
" " Sulphate Potash	Reduces little
" " Lactate Protoxide Bismuth	Reduces Gr
" " Bromide Cadmium	No Change
" " Bi Carb Soda	Reduces little
" " Ammonia Water	No Change



Spectrum Tests Continued 61

Dec 17th 1878. L.K.B.

Glycerine and Nitrate Strontia	No change
" " Balsam Copaiva	Reduces little
" " Cardamom	Reduces
" " Salicate Sodium	Reduces little
" " Fusel Oil	Reduces
" " Potassic Tartrate	Reduces little
" " Citrate Potash	Reduces
Aniline Oil & Citrate Potash	Reduces little
" " & Resorcin	Reduces little
" " & Valerianate Zinc	Reduces little
" " & Amygdalin	Reduces little



Spectrum Tests continued 67.

Dec 17th 1878 DKR

Amilsul Oil & Quinidine Sulph.	Reduces Lines
" " & Bi Carb Soda	Reduces
" " & Bismuth Lactate, Chloride	
" " & Cadmium Bromide	
" " Sulphate Potash	Reduces Lines
" " Prescriptn Nitrate	Reduces
" " Acetate Potassium	
" " Sweet Oil	Reduces Lines
" " Delicate Soda	Reduces
" " Balsam Copaiba	Reduces
" " Nitrate Stronlia	Reduces

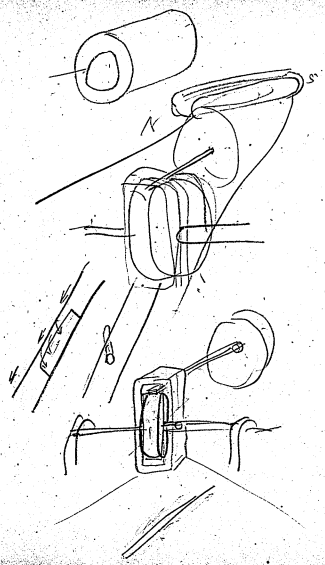
Spectrum Seats continued
Dec 18. 1878

Aniline Oil &	Ammonia	Reduces.
" "	Sulph. Zinc	Reduces alte
" "	Chloride Mercury	Reduces alte
" "	Caustic Potash	Reduces
" "	Balsam Peru	Reduces
" "	Benzoic acid	Reduces alte
" "	Tannic acid	Reduces
" "	Cochineal	Reduces
" "	Gamine	Reduces
" "	Dextrine	Reduces
" "	Chloride Zinc	Reduces alte
" "	Glycerine	Reduces

Dec. 18. 1878
Arthur H. Rowell

Spectrum Stds Continued
Dec. 18. 1878 (ARR)

Aniline Oil and Alcohol	Reduces Litmus
" " Valerianic Acid	Reduces Litmus
" " Lactic Acid	Reduces Litmus
" " Citric Acid	Reduces Litmus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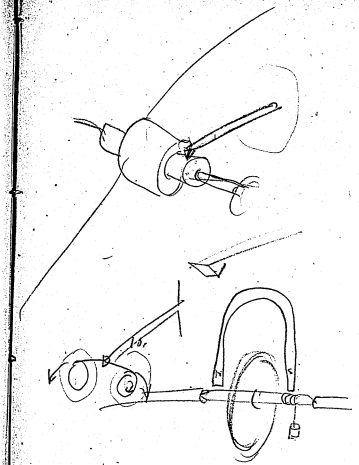
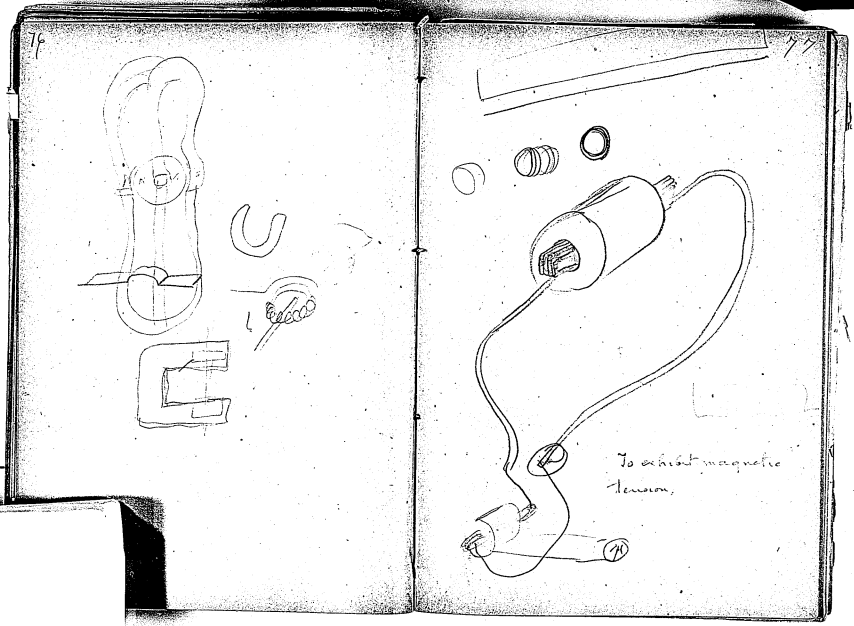
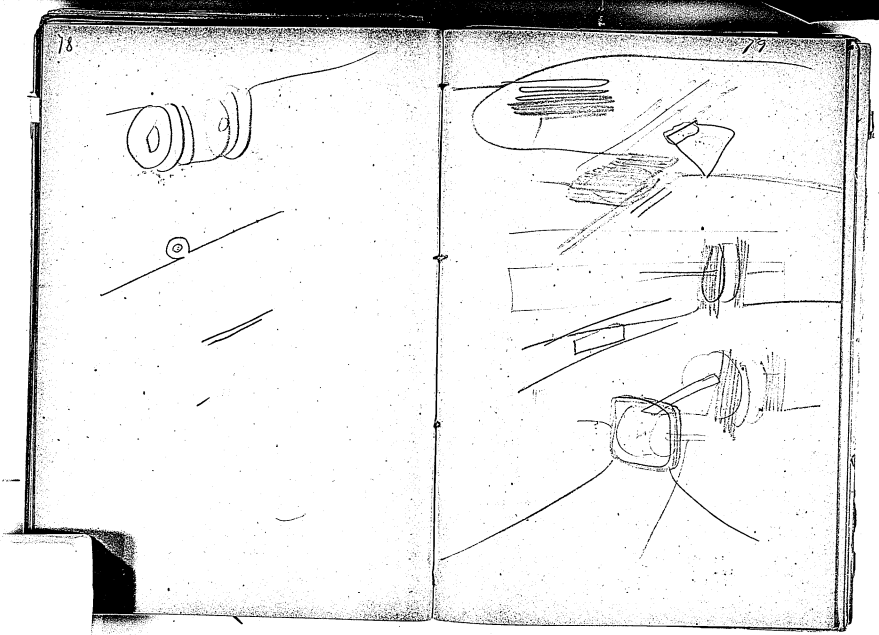



To exhibit magnetic
tension.

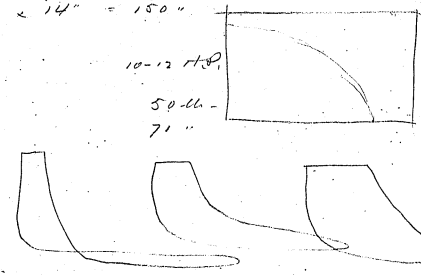

78
79

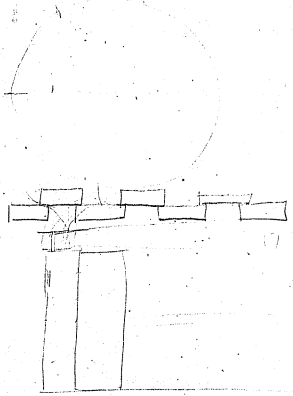
16" x 31" = 62 Rs
6" x 14" = 215 "
6" x 14" = 150 "

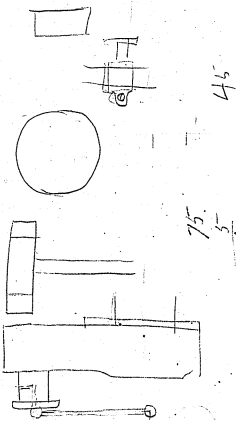
10-12 Rs

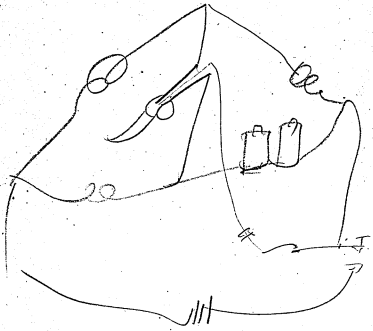
50-60 -

70 "






45
75.
3-
37 5.



4400

32

40
90
3600

70000
15000
10000
10000

25000

6

60

3200
16
19200
200
51200

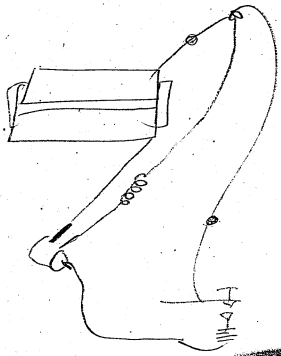
5

3 Comm Geom

1 1/2 3 0 mi

14
6
102

.4400
16
26400
4400
70400



1 4400
416
4816

2 9648

8976

176

320
39
5

1
2
3
50

50

4
40
36

4816
432
5248
4400
9648

12
40
52

4400. End 1st — 25 yrs elapsed
4576 - End 2 "
4400 End 2 yrs elapsed
359 End 3
9335 — End 3
4400
13735 → End 4
549
14284 End 4
4443
18724
749
19473 5th great

15
40
20

12473
4400
23873
936
24809 6
4400
29209
1168
30377 7
4400
34777
1391
36168 - 8
4453
40566
1622
42190
4400
46590
1863
48453 10

23
40
920
16
936

29
40
1168

34
40
1360

40
40
1600

44
40
1840

100012
4400
104412
4176
108588

18

4176

4400
17
308800
4400
748800

48453. 10 [illegible]

4400
52853
2114
54967 — 11

4400
59367
2374
61741 — 12

4400
66141
2644
68786 — 13

4400
73186
2927
76113 — 14

4400
80613
3224
83837 — 15

4400
88237
3529
91766 — 16

4400
96166
3846
100012 — 17

52
40
2080
32
2114

59
40
2359

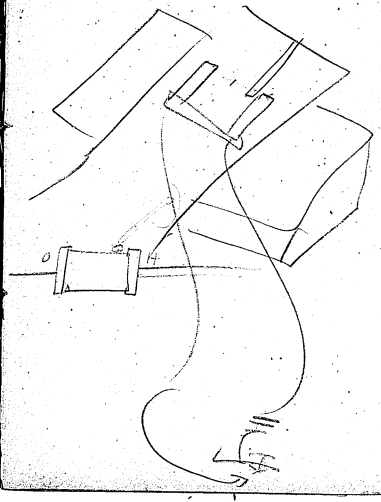
66
40
2640

73
40
2927

80
40
3224

88
40
3529

96
40
3846


1
2
3
4

1/3

150
8.0
12,000..

Kruzi Esq

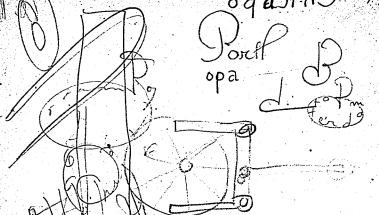
150
8.0
12,000
1,440
9600
120
9600
120
1801
120

John Kruzi

Professor John Kruzi Esq

1800

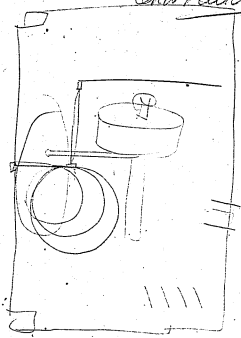
1501

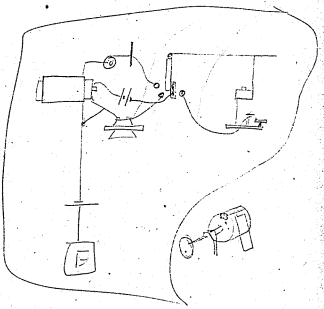


Ford
Portland
Portland
Portland

New Receiver Feb 23 1979

Chas Batchelor

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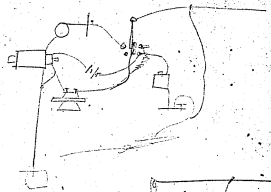
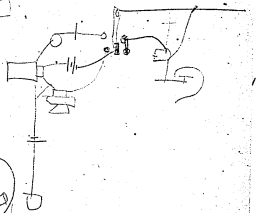
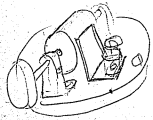
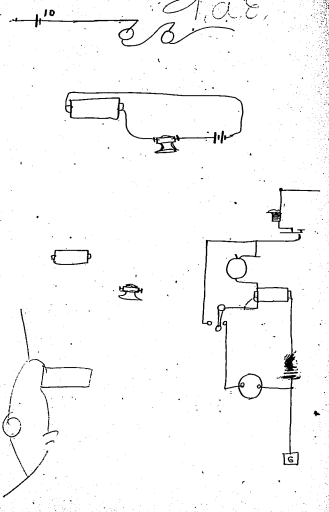






Feby 26. 1878.

T.A.E.



Spinal in vacuum

3-42 P.M. 2 cells

3 51 3 cells

3 55 " 4 cells

4 00 PM 5 cells

White tint very good light

4 05 6

4 09 7

4 14

4 20 10 cells

4 22 11 cells

3 (25

9 × 9 = 81

81 / 3 = 243

4½ × 6 = 36

2½ × 6 = 15

45 × 6 = 270

3 ohms

3 (2.6 Volts

9 Webers

1/1 = 1 Weber

2/1 = 2 W

2/2 = 1 Weber

9 × 9 = 81

Unit of Work

Energy

3564

10.692) 33.000 (3.0 lamps
32076
924 0

3300, 1

7370) 33000 (4.6 lamps
29486
35206

46 | 1006 | 22
92
80

.33 .22

3 | 26 Volts
9 Webers

March 5, 1879.

4 | 26
6.5

9
9
81 = units of Work
44 ft lbs
3
243 X 44 ft lbs
44
972
972
3 | 10.692
6.5 3.564
6.5
325
390
42.25 X
4
169.00 X 44 ft lbs.
44
676
670
2 | 7370
3685

~~279)10.69 (4~~

29)106 (3.2
97
90

297)737 (2.4
594
1430

237)3300 (14
237
930

8 Ohms

10

10 | 2.6

2.6 Webers

2.6
2.6
156
52
676
676
676
44
2704
2700
1/3.3
5 | 29.4
594
10,000.
2379.6
3600

1

.4,

6)26
4 1/3

2 Batts
4

4.33
4.33
1299
1299
1732
18.7489 Units
6
119.44
44
44576
44376
3)49033 = Total
1634.45 Batting
2)32687.1 Both Counts
16344

5/26

5.2

5.2
5.2
104
260
27.04
5
20

I cannot find the last number but I know from the Experiments that it was No. 60

March 7. 1879.

Ex. No. 61. Ground spinal with Magnesia from the Sectates. The spinal was brought up suddenly and acidified with ... fresh cells very acid.

March 16. 1879

We was all night bringing
up 12 lamps in vacuum
worked all day Sunday
all night Sunday night
all day Monday

1 lb Coal 6 hp 1 hour

.10

60 | 3393. (56
300
393
360
33

60 | 3393.
6

33000

6

1.74

33000 | 12000 000 000 (3393
99000
130000
99000
310000
297000
130000
99000
31000

12
30
360

12 lamps 1000 Rev

1100 revolut

11
11

12 | 121 | 12 | 1452

$10^2 : 11^2 :: 12 : \frac{121}{12}$ 1452

14 lamps

1200 17 lamps

$10^2 : 12^2 :: 12 :$ 144 / 12 / 1728

1300 20 lamps

13
39
13
169
12
2006

14400 23 lamps

14
56
14
196
12
2332

1500 27 lamps

15
75
15
225
12
2700

1600 30 lamps

16
16
96
16
256
12
3072

1700 revolutions

17
17
119
17
289
12
3468

34 lamps

1800
18
144
18
324
12
3888

38 lamps

1900
19
171
19
361
12
4332

43

2000
20
400
12
4800

48 lamps

2100
21
21
42
441
12
5292

53 lamps

2200
22
22
44
44
484
12
5808

58

23 00
23
69
46
529
12
6348

63 lamps

24 00
24
96
48
576
12
6912

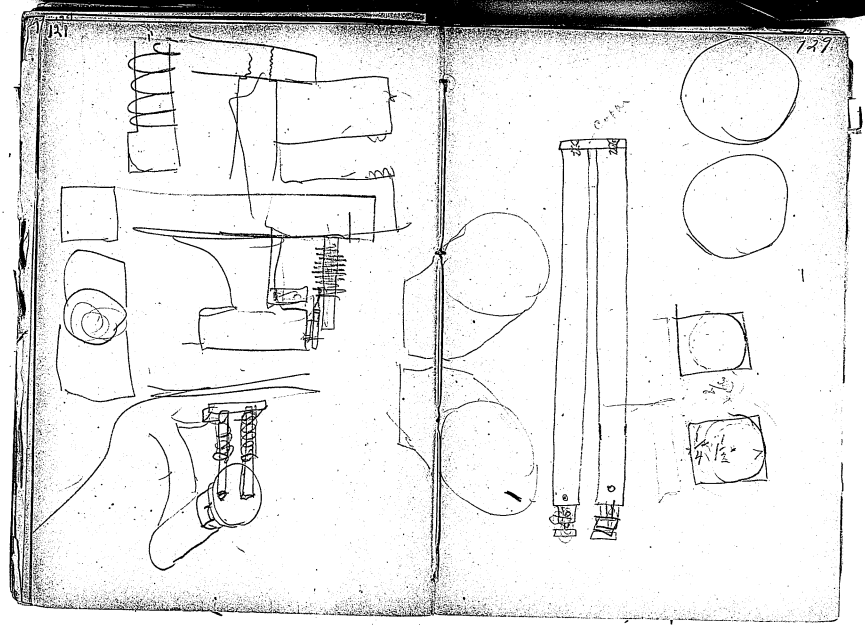
69 lamps

25 00
25
625
12
7500

76 lamps

50 00
50
2500
12
30000

300



Thermopiles

Iron soft = Iron hard - grey cast iron, white cast iron - case hardened iron - steel soft = steel glass hard - steel to a straw - steel to a blue, - steel hardened on the copper end - Zinc ~~steel~~ cast - Cadmium Tin - Aluminum Lead, brass white = Common brass, composition Babbitt metal - Nickel - Copper soft = Silver Bismuth, Antimony - Sulphide Lead, Sulphide Tin - Sulphide Iron, Sulphide Bismuth Sulphide Antimony - Sulphide Nickel - Sulphide Copper, Sulphide Manganese, Sulphide Chromium. German Silver - Bell metal = Rose metal - Mercury metal = Phosphor bronze Aluminum bronze = Sulphide Mercury Sulphide Tungsten = Pewter = Britannia ware - Carbon - retort = battery = Coke - Wallin - Coke -

Sulphuret Cobalt = Cobalt –

Hyperoxide Lead – Iodide Copper –

Peroxide Manganese – Iron reduced

by Hydrogen = Sodium amalgam.

Potassium amalgam = plumbago –

Red phosphorous =

Edisons Telephone June 6th 1879

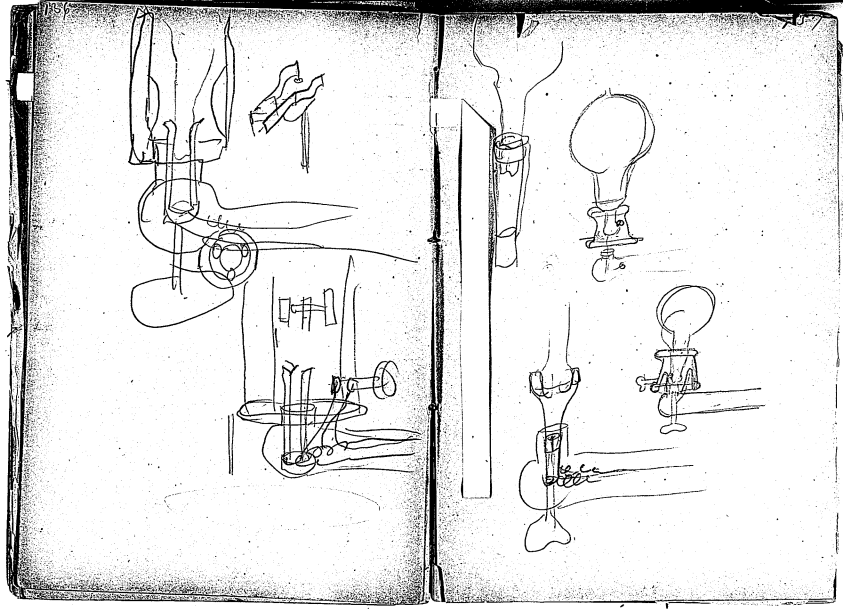
Chas Batchelor

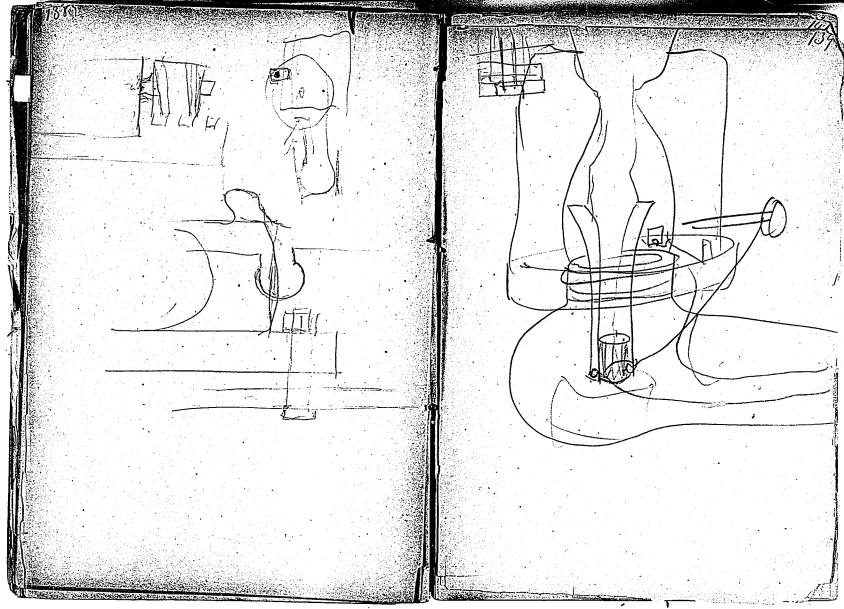
Chalks for Receiver

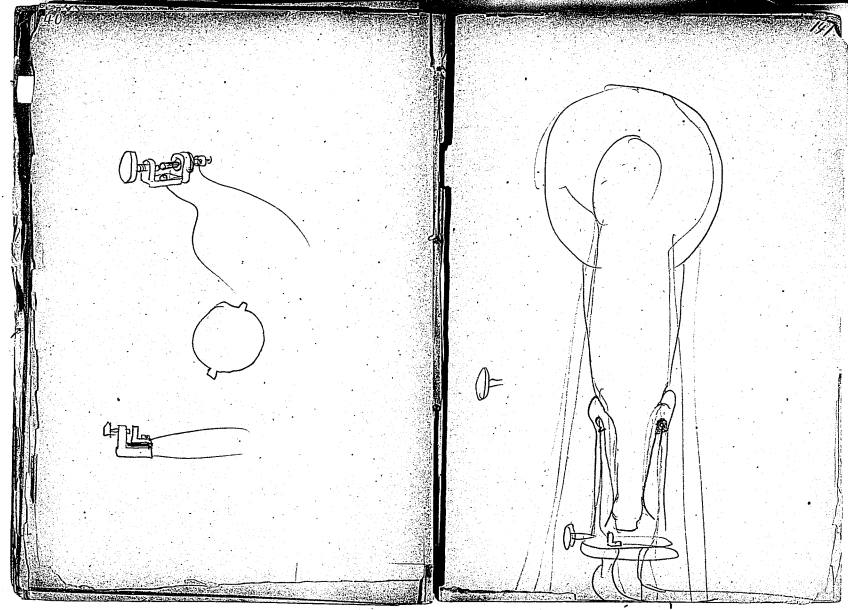
— 12 oz. pp. Chalk
— 36 grams Mercurous Acetate dissolved in ½ Litre water and filtered —
— This solution and Chalk intimately mixed and dried out to thick paste
— Then 2 oz (fluid) of Saturated Solution of Caustic Potash intimately mixed

Then was dried & sifted through 100 sieve & pressed

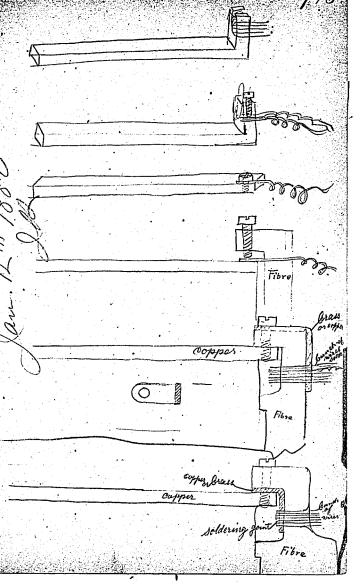
2 — No 1 As much as 3 can press
2 No 2 " " " 2 " "
2 No 3 " " " 1 " —
2 No 4 " " . 1 in short lever
No 5 —— very small

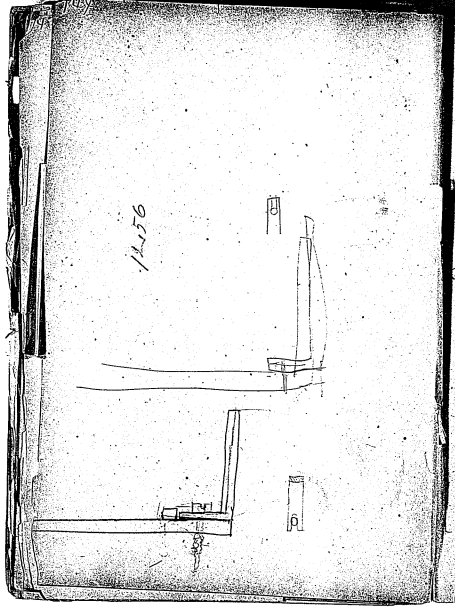


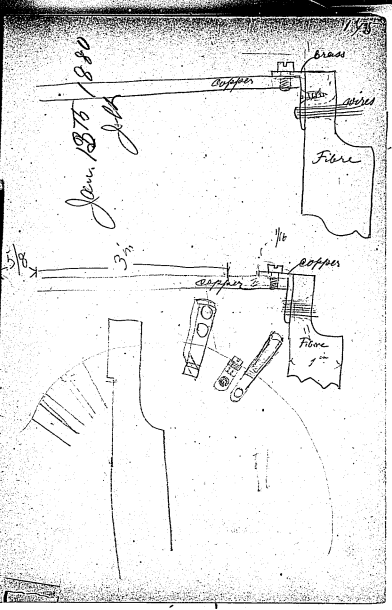


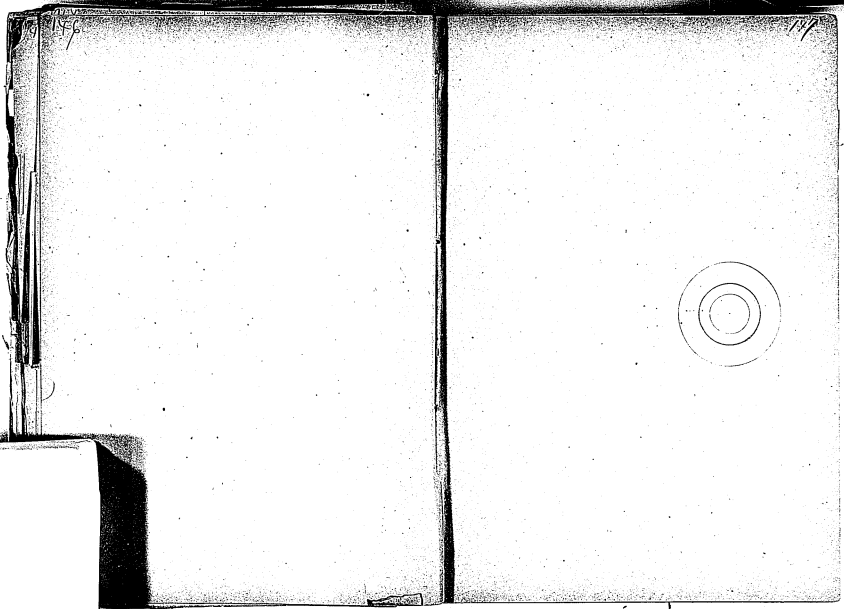


Jan. 12th 1880




1/4 56

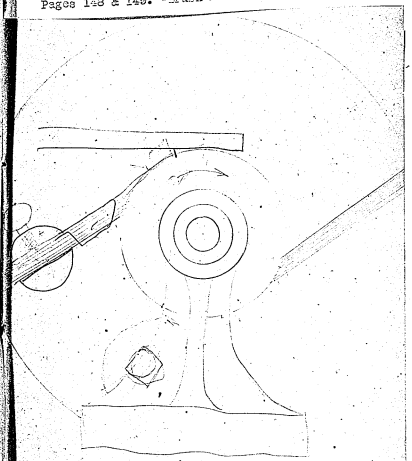

Jan 1878
Brass
Copper
Fibre
Copper
Fibre

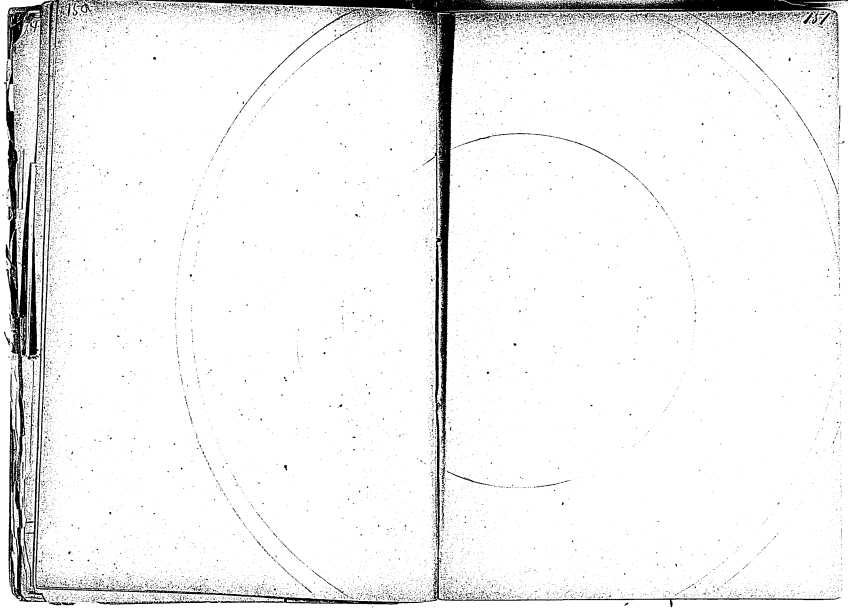


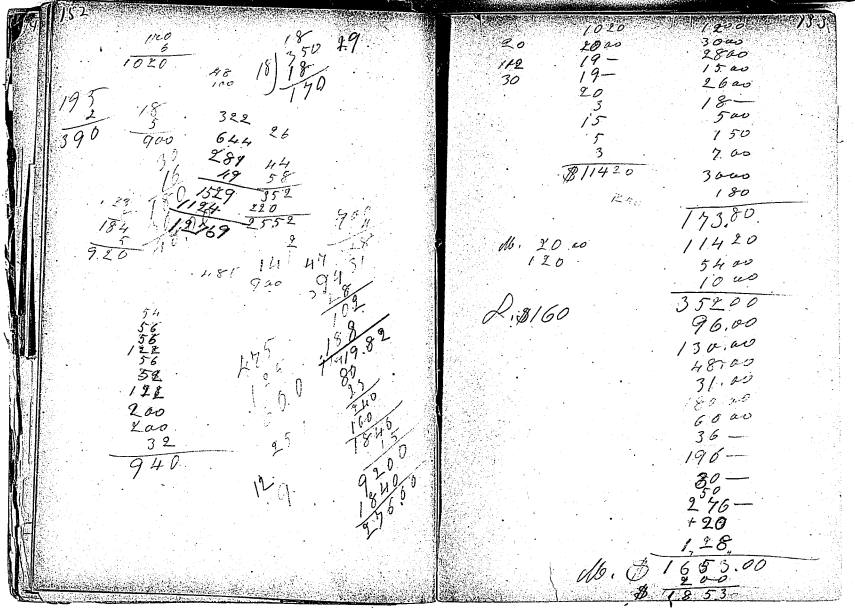
Previous to Jan. 15th 1880

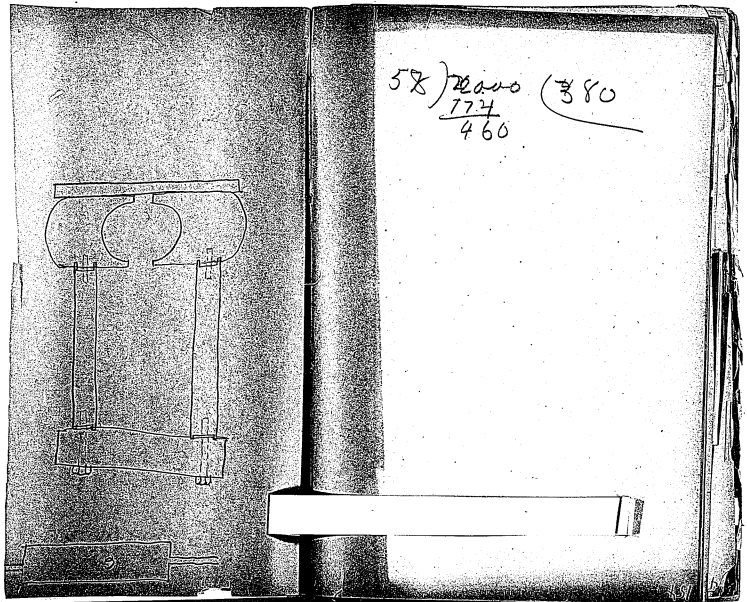
Thos Patents

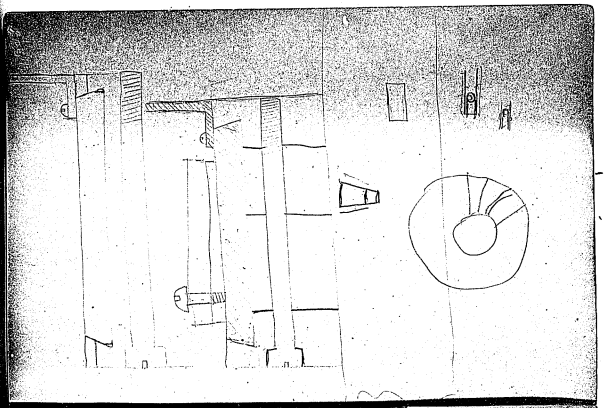
Pages 148 & 149. "Brush Holders."

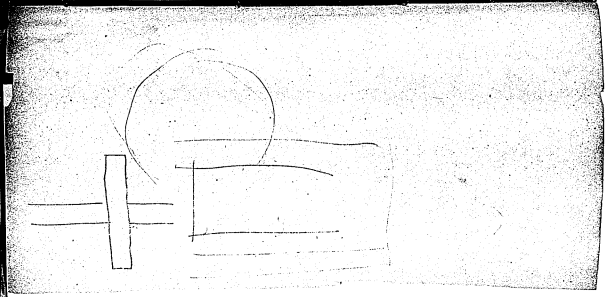


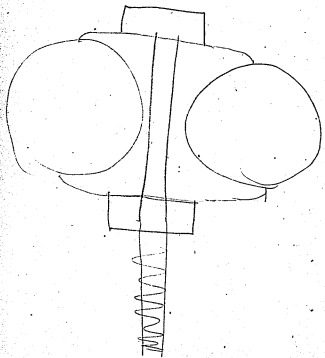


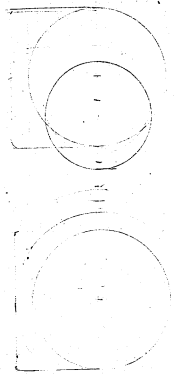


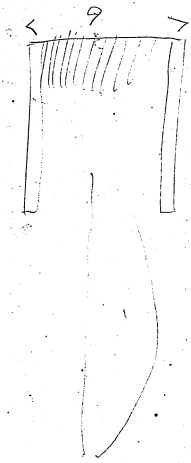

58) 2000 (380
174
460











92
73
12 | 35 = 68

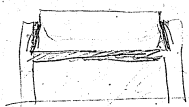
19.68

9.75
9.75
20 68
25 00

63.93
24

2608
1304
12 | 156.48 = 1304
75

2500
1304
9780



775 | 280 :: 22000

250
22000
560000
560.
775 | 616000 | 8000.
6220

125 | 300000 | 240
250
500

5 | 240
4
24.

380 380

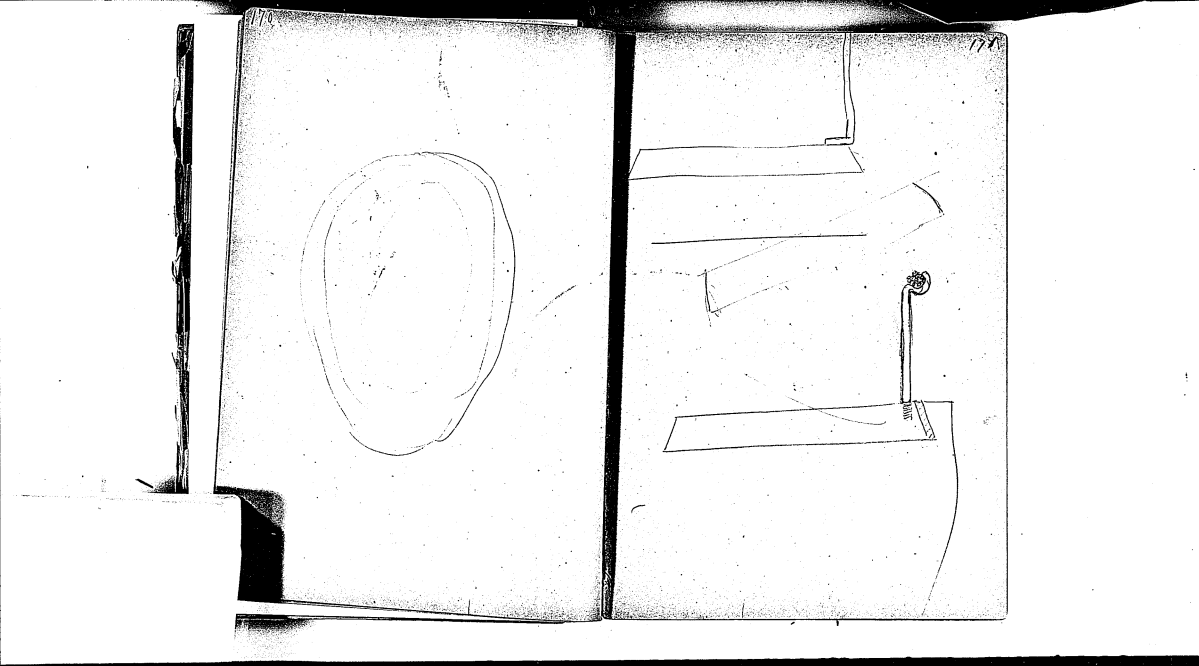
168

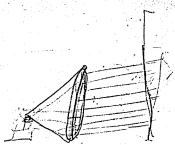
125) 580 (4.0.6
500
800
750
50

169

28
85000
132000

125) 13200 (105
125
700





Fox 15, 53.

Portland

6

150
50
7500
80
600,000

Broadsham

55 5 5 120

Fox 73 7300

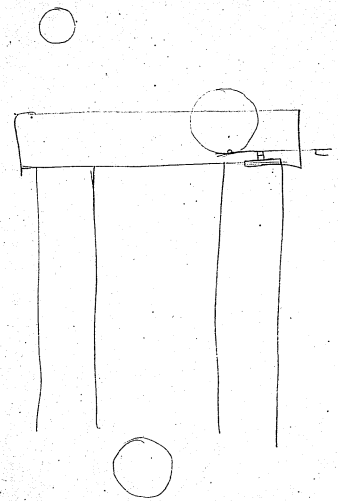
150 29 75

127

13 5 0
3 0 0
43 5 5 0
4 5 8 0

15, 34 8 0 0 127 129
129 348 0 0 127
3821, 8 0 0
129 127
129 110,

16φ
1:5



6 X 6 1/4

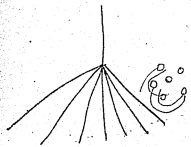
45

5 1/8

6

5

6



31

14 540

512

57

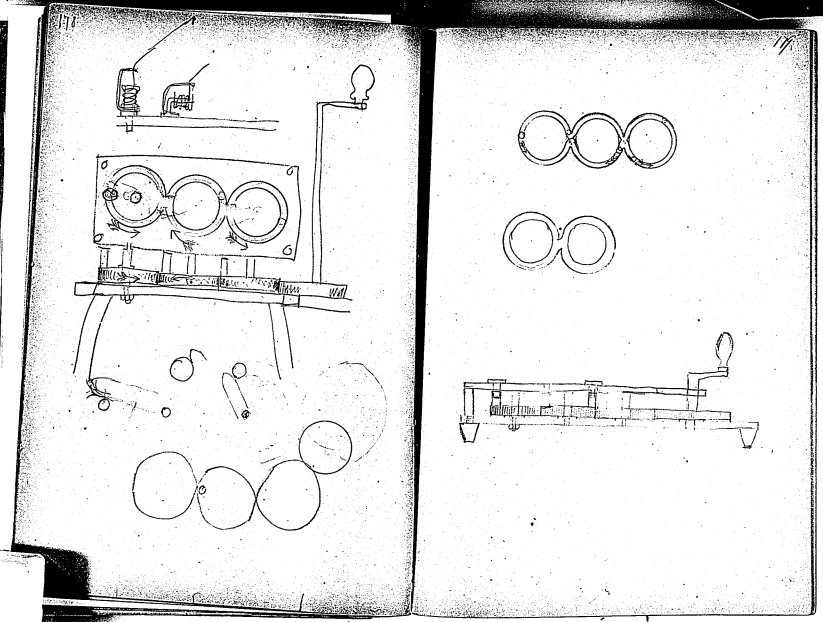
14 8 aires

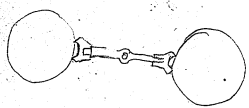
70

100

50

14.





2

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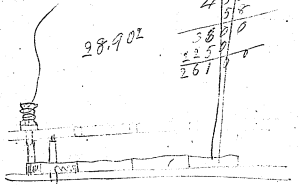
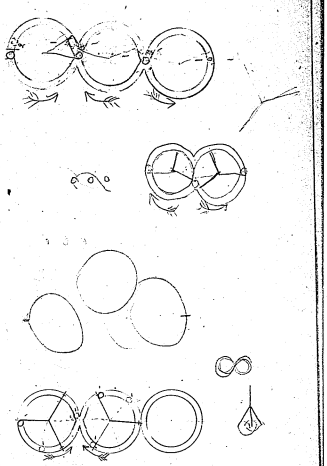
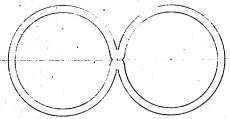
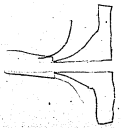
1400
290
29.700

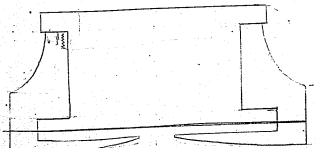
98.902











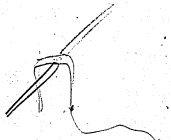
.25 6.28 = .25.1
128
30

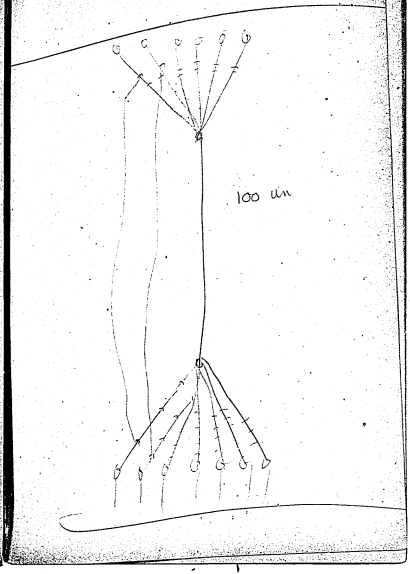
4)6.28=1.32
2

6. 28/37

6 1/4 4 25
= .251

25 25)628
128
30





90

.025) .054 (2.16
.050
40
25
15

012
2.4
.0096
4.6
576
384
.04416
.054

6.0) 1.4
4.6

12 candles free

54 : 94 ::
27 22
12
44
27) 238 (9.8
243
10

191

3/16

50
300

.032
3.075
.632
6050
9075
.096800

2.65
1.325
3.975
17
27725
39775
.67475

3.975
.674
3.301

~~113~~
25

$$R = \frac{l}{d^2}$$

33000

$\frac{16}{7}$
11^2

Arithmetic

1	10	1/2
2	5	1/4
4	2	1/2 1/8
8	1	1/4 1/16
16	1/2	1/8 1/32

20.

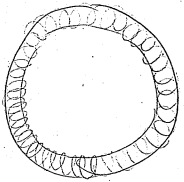
1/2 1/3 1/4

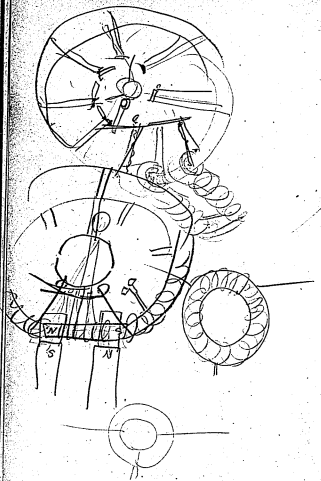
1/4 1/4 1/4

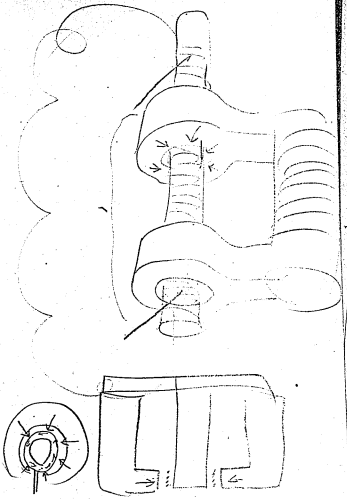
1/4 1/4

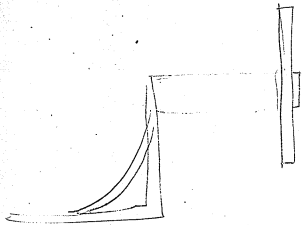
1/16

21/32 gain









MUNSONS
POSITIVELY NOT TO BE TAKEN FROM THE ROOM